

# Erratum

## Erratum: Fernandez-Palomo, C., et al. Animal Models in Microbeam Radiation Therapy: A Scoping Review. *Cancers* 2020, 12, 527

Cristian Fernandez-Palomo <sup>1</sup>, Jennifer Fazzari <sup>1</sup>, Verdiana Trappetti <sup>1</sup>, Lloyd Smyth <sup>2</sup>, Heidrun Janka <sup>3</sup>, Jean Laissue <sup>1</sup> and Valentin Djonov <sup>1,\*</sup>

- <sup>1</sup> Institute of Anatomy, University of Bern, 3012 Bern, Switzerland; cristian.fernandez@ana.unibe.ch (C.F.-P.); jennifer.fazzari@ana.unibe.ch (J.F.); verdiana.trappetti@ana.unibe.ch (V.T.); jean-albert.laissue@pathology.unibe.ch (J.L.)
- <sup>2</sup> Department of Obstetrics & Gynaecology, University of Melbourne, 3057 Parkville, Australia; lloyd.smyth@unimelb.edu.au
- <sup>3</sup> Medical Library, University Library Bern, University of Bern, 3012 Bern, Switzerland; heidrun.janka@ub.unibe.ch
- \* Correspondence: valentin.djonov@ana.unibe.ch; Tel.: +41-31-631-8432

Received: 8 October 2020; Accepted: 27 October 2020; Published: 29 October 2020



The authors wish to make the following corrections to this paper [1]:

The 33 references in Table 1 were incorrectly linked to the bibliography in the original manuscript due to a problem with the reference manager software. The original Table 1 is listed below:

**Table 1.** MRT Parameters Used in Cancer Models.

Animal	Cancer Type	Number of Arrays	Microbeam		Peak-Dose (Gy)	Valley-Dose (Gy)	Evaluated Criteria
			Width (μm)	Spacing (μm)			
Rat [1]	Gliosarcoma (9L)	1 & 2	50	200	400 entrance dose; 350 @1cm depth	12.5 @1cm depth	Animal survival, tumour growth, tumour vasculature, and cell proliferation
Rat [2]	Gliosarcoma (9L)	2	50	200	480 entrance dose; 418 @1cm depth	18.6 @1cm depth	Animal survival, cell cycle, and DNA distribution patterns
Rat [3]	Gliosarcoma (9L)	2	50	200	400 entrance dose; 350 @1cm depth	12.5 @1cm depth	Tumour vasculature and tumour oxygenation
Rat [4]	Gliosarcoma (9L)	1	50	200	400 dose @tumour (i.e., @7mm depth)	18 dose @tumour (i.e., @7mm depth)	Animal survival and Transcriptomics
Rat [5]	Gliosarcoma (9L)	1	50	200	400 dose @tumour (i.e., @7mm depth)	8 dose @tumour (i.e., @7mm depth)	Tumour growth, transcriptomics, and histopathology
Rat [6]	Gliosarcoma (9L)	1	50	200	400 dose @tumour (i.e., @7mm depth)	17.4 dose @tumour (i.e., @7mm depth)	Animal survival, tumour growth, cell proliferation, and gene expression
					200 dose @tumour (i.e., @7mm depth)	8.7 dose @tumour (i.e., @7mm depth)	
Rat [7]	Glioma (F98)	2	50	200	241.4 entrance dose	10.5 @9mm depth	Tumour vasculature and tumour oxygenation
Mouse [8]	Mammary (EMT6.5/67NR)	1	25	200	560 entrance dose	8.5 @centre of brain	Animal survival, DNA damage, cell proliferation, and apoptosis
					800 entrance dose	12 @centre of brain	
					280 entrance dose	8.5 @centre of brain	
		2			560 entrance dose	17 @centre of brain	

Table 1. Cont.

Animal	Cancer Type	Number of Arrays	Microbeam		Peak-Dose (Gy)	Valley-Dose (Gy)	Evaluated Criteria
			Width (µm)	Spacing (µm)			
Rat [9]	Gliosarcoma (9L)	1	27	50	150 entrance dose; 108 @centre of brain	20 @centre of brain	Animal survival and histopathology
					250 entrance dose; 179 @centre of brain	34 @centre of brain	
					300 entrance dose; 215 @centre of brain	40 @centre of brain	
				75	250 entrance dose; 179 @centre of brain	17 @centre of brain	
					300 entrance dose; 215 @centre of brain	20 @centre of brain	
					500 entrance dose; 359 @centre of brain	33 @centre of brain	
Mouse [10]	Mammary (EMT6.5)	1	90	300	500 entrance dose; 359 @centre of brain	19 @centre of brain	Tumour ablation
					800 dose @tumour	16 dose @tumour	
					890 dose @tumour	18 dose @tumour	
					970 dose @tumour	19 dose @tumour	
		2	90	300	1740 dose @tumour	35 dose @tumour	
					1820 dose @tumour	36 dose @tumour	
					1900 dose @tumour	38 dose @tumour	
					410 dose @tumour	16 dose @tumour	
Rat [11]	Glioma (C6)	1	25	200	17.5, 35, 70, 350 entrance dose	0.51, 1.03, 2, 10.3	Bystander effects in-vivo by clonogenic cell survival
Rat [12]	Glioma (C6)	1	25	200	35, 70, 350 entrance dose	NR	DNA damage
Rat [13]	Glioma (F98)	1	25	200	20, 200 entrance dose	NR	Bystander effects in-vivo by clonogenic cell survival and cellular calcium fluxes
Mouse nude [14]	Glioma (F98)		50	400	22, 110 entrance dose	0.5, 2.5	Bystander effects in-vivo by clonogenic cell survival and cellular calcium fluxes
Mouse [15]	Mammary (4T1)	1	50	200	150 @5 mm depth	7.5 in a 10 mm solid water phantom	Tumour growth, tumour vasculature, and tumour hypoxia
Mouse [16]	Mammary (EMT6.5)	1	25	200	112, 560	NR	Immune response by gene expression and histopathology
Rat [17]	Gliosarcoma (9L)	1	50	200	400 entrance dose	NR	Tumour vasculature, and tumour hypoxia
Rat [18]	Gliosarcoma (9L)	1	25	100	625 entrance dose	NR	Animal survival, tumour growth, and histopathology
Mouse [19]	Squamous cell carcinoma (SCCVII)	1	35	200	442, 625, 884 entrance dose	NR	Animal survival, tumour growth, and tumour ablation
			70	200	442 entrance dose		
Rat [20]	Glioma (C6)	2	25	200	350 entrance dose	NR	Optic nerve damage by histopathology
Mouse [21]	Melanoma (B16F10)	1	50	200	407.6 dose @tumour	6.2 dose @tumour	Tumour growth, tumour vasculature, cell proliferation, cell senescence, and immune response

Table 1. Cont.

Animal	Cancer Type	Number of Arrays	Microbeam		Peak-Dose (Gy)	Valley-Dose (Gy)	Evaluated Criteria
			Width (µm)	Spacing (µm)			
Rat [22]	Gliosarcoma (9L)	1	25	200	625 entrance dose	12.1 dose @tumour	Animal survival, tumour growth, and histopathology
				100	625 entrance dose	36 dose @tumour	
Rat [23]	Gliosarcoma (9L)	1	25	200	625 entrance dose	NR	Animal survival, tumour growth, and histopathology
Mouse [24]	Mammary (EMT6.5)	1	25	200	560 entrance dose	11	Biochemical changes by synchrotron Fourier-transform infrared microspectroscopy
Rat [25]	Glioma (C6, F98)	2	25	211	350 entrance dose	NR	Animal survival and object recognition
Rat [26]	Glioma (F98)	2	28	400	350	18 dose @ tumour	Animal survival and cognitive dysfunction
Mouse nude [27]	Gliosarcoma (9L)	1	25	211	500 entrance dose	24 (cross-fired)	Animal survival, tumour growth, and tumour vasculature
Rat [28]	Gliosarcoma (9L)	2	25	211	860 entrance dose	18 @1cm depth	Animal survival and histopathology
			50		480 entrance dose		
			75		320 entrance dose		
Rat [29]	Gliosarcoma (9L)	3	50	211	400, 360 (+24h), 400 (+48h) entrance dose	15	Animal survival and histopathology
Rat [30]	Gliosarcoma (9L)	1	27	211	625 entrance dose	NR	Animal survival, histopathology, and immune response
Mouse [31]	Mammary (EMT6.5)	1	25	200	560	11	Transcriptomics
Mouse nude [32]	Glioma (U251)	1	100	500	124	4.8	Tumour growth, histopathology, and apoptosis
		2	20	100	111	8.2	
			100	500	124	9.6	
Mouse [33]	Mammary (EMT6.5)	1	25	200	112, 560	NR	Immune response

NR: Not-Reported.

And should be replaced with the following version:

Table 1. MRT parameters used in cancer models.

Animal	Cancer Type	Number of Arrays	Microbeam		Peak Dose (Gy)	Valley Dose (Gy)	Evaluated Criteria
			Width (µm)	Spacing (µm)			
Rat [32]	Gliosarcoma (9L)	1 and 2	50	200	400 entrance dose; 350 @ 1 cm depth	12.5 @ 1 cm depth	Animal survival, tumour growth, tumour vasculature, and cell proliferation
Rat [37]	Gliosarcoma (9L)	2	50	200	480 entrance dose; 418 @ 1 cm depth	18.6 @ 1 cm depth	Animal survival, cell cycle, and DNA distribution patterns
Rat [33]	Gliosarcoma (9L)	2	50	200	400 entrance dose; 350 @ 1 cm depth	12.5 @ 1 cm depth	Tumour vasculature and tumour oxygenation
Rat [29]	Gliosarcoma (9L)	1	50	200	400 dose @ tumour (i.e., @ 7 mm depth)	18 dose @ tumour (i.e., @ 7 mm depth)	Animal survival and transcriptomics
Rat [30]	Gliosarcoma (9L)	1	50	200	400 dose @ tumour (i.e., @ 7 mm depth)	8 dose @ tumour (i.e., @ 7 mm depth)	Tumour growth, transcriptomics, and histopathology

Table 1. Cont.

Animal	Cancer Type	Number of Arrays	Microbeam		Peak Dose (Gy)	Valley Dose (Gy)	Evaluated Criteria
			Width (µm)	Spacing (µm)			
Rat [31]	Gliosarcoma (9L)	1	50	200	400 dose @ tumour (i.e., @ 7 mm depth)	17.4 dose @ tumour (i.e., @ 7 mm depth)	Animal survival, tumour growth, cell proliferation, and gene expression
					200 dose @ tumour (i.e., @ 7 mm depth)	8.7 dose @ tumour (i.e., @ 7 mm depth)	
Rat [42]	Glioma (F98)	2	50	200	241.4 entrance dose	10.5 @ 9 mm depth	Tumour vasculature and tumour oxygenation
Mouse [50]	Mammary (EMT6.5/67NR)	1	25	200	560 entrance dose	8.5 @ centre of brain	Animal survival, DNA damage, cell proliferation, and apoptosis
					800 entrance dose	12 @ centre of brain	
		2			280 entrance dose	8.5 @ centre of brain	
					560 entrance dose	17 @ centre of brain	
Rat [15]	Gliosarcoma (9L)	1	27	50	150 entrance dose; 108 @ centre of brain	20 @ centre of brain	Animal survival and histopathology
					250 entrance dose; 179 @ centre of brain	34 @ centre of brain	
					300 entrance dose; 215 @ centre of brain	40 @ centre of brain	
					250 entrance dose; 179 @ centre of brain	17 @ centre of brain	
				75	300 entrance dose; 215 @ centre of brain	20 @ centre of brain	
					500 entrance dose; 359 @ centre of brain	33 @ centre of brain	
					500 entrance dose; 359 @ centre of brain	19 @ centre of brain	
				100	500 entrance dose; 359 @ centre of brain	19 @ centre of brain	
Mouse [49]	Mammary (EMT6.5)	1	90	300	800 dose @ tumour	16 dose @ tumour	Tumour ablation
					890 dose @ tumour	18 dose @ tumour	
					970 dose @ tumour	19 dose @ tumour	
					1740 dose @ tumour	35 dose @ tumour	
					1820 dose @ tumour	36 dose @ tumour	
					1900 dose @ tumour	38 dose @ tumour	
		2	90	300	410 dose @ tumour	16 dose @ tumour	
					520 dose @ tumour	21 dose @ tumour	
					650 dose @ tumour	26 dose @ tumour	
Rat [19]	Glioma (C6)	1	25	200	17.5, 35, 70, 350 entrance dose	0.51, 1.03, 2, 10.3	Bystander effects in vivo by clonogenic cell survival
Rat [44]	Glioma (C6)	1	25	200	35, 70, 350 entrance dose	NR	DNA damage
Rat [43]	Glioma (F98)	1	25	200	20, 200 entrance dose	NR	Bystander effects in vivo by clonogenic cell survival and cellular calcium fluxes
Mouse nude [47]	Glioma (F98)		50	400	22, 110 entrance dose	0.5, 2.5	Bystander effects in vivo by clonogenic cell survival and cellular calcium fluxes
Mouse [55]	Mammary (4T1)	1	50	200	150 @ 5 mm depth	7.5 in a 10-mm solid water phantom	Tumour growth, tumour vasculature, and tumour hypoxia
Mouse [52]	Mammary (EMT6.5)	1	25	200	112, 560	NR	Immune response by gene expression and histopathology
Rat [38]	Gliosarcoma (9L)	1	50	200	400 entrance dose	NR	Tumour vasculature, and tumour hypoxia
Rat [25]	Gliosarcoma (9L)	1	25	100	625 entrance dose	NR	Animal survival, tumour growth, and histopathology

Table 1. Cont.

Animal	Cancer Type	Number of Arrays	Microbeam		Peak Dose (Gy)	Valley Dose (Gy)	Evaluated Criteria
			Width (µm)	Spacing (µm)			
Mouse [56]	Squamous cell carcinoma (SCCVII)	1	35	200	442, 625, 884 entrance dose	NR	Animal survival, tumour growth, and tumour ablation
			70	200	442 entrance dose		
Rat [45]	Glioma (C6)	2	25	200	350 entrance dose	NR	Optic nerve damage by histopathology
Mouse [7]	Melanoma (B16F10)	1	50	200	407.6 dose @ tumour	6.2 dose @ tumour	Tumour growth, tumour vasculature, cell proliferation, cell senescence, and immune response
Rat [20]	Gliosarcoma (9L)	1	25	200	625 entrance dose	12.1 dose @ tumour	Animal survival, tumour growth, and histopathology
				100	625 entrance dose	36 dose @ tumour	
Rat [36]	Gliosarcoma (9L)	1	25	200	625 entrance dose	NR	Animal survival, tumour growth, and histopathology
Mouse [54]	Mammary (EMT6.5)	1	25	200	560 entrance dose	11	Biochemical changes by synchrotron Fourier-transform infrared microspectroscopy
Rat [40]	Glioma (C6, F98)	2	25	211	350 entrance dose	NR	Animal survival and object recognition
Rat [41]	Glioma (F98)	2	28	400	350	18 dose @ tumour	Animal survival and cognitive dysfunction
Mouse nude [46]	Gliosarcoma (9L)	1	25	211	500 entrance dose	24 (cross-fired)	Animal survival, tumour growth, and tumour vasculature
Rat [34]	Gliosarcoma (9L)	2	25	211	860 entrance dose	18 @ 1 cm depth	Animal survival and histopathology
			50		480 entrance dose		
			75		320 entrance dose		
Rat [35]	Gliosarcoma (9L)	3	50	211	400, 360 (+24 h), 400 (+48 h) entrance dose	15	Animal survival and histopathology
Rat [39]	Gliosarcoma (9L)	1	27	211	625 entrance dose	NR	Animal survival, histopathology, and immune response
Mouse [51]	Mammary (EMT6.5)	1	25	200	560	11	Transcriptomics
Mouse nude [48]	Glioma (U251)	1	100	500	124	4.8	Tumour growth, histopathology, and apoptosis
		2	20	100	111	8.2	
			100	500	124	9.6	
Mouse [53]	Mammary (EMT6.5)	1	25	200	112, 560	NR	Immune response

NR: not reported.

The authors would like to apologize for any inconvenience caused to the readers by these changes. The original article has been updated.

## References

1. Fernandez-Palomo, C.; Fazzari, J.; Trappetti, V.; Smyth, L.; Janka, H.; Laissue, J.; Djonov, V. Animal Models in Microbeam Radiation Therapy: A Scoping Review. *Cancers* **2020**, *12*, 527. [[CrossRef](#)] [[PubMed](#)]

**Publisher's Note:** MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



© 2020 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).